

Application N .: 10/054,605

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(20140-00300-US)

REMARKS

Claims 1-5, 7-10, 18-22, 24-27 and 35-38 are now in the application. Claims 37 and 38 have been amended to clarify that the metal phosphide-conductive film is the conductive film referenced in claims 1, 2, 18 and 19, respectively.

The amendment to claims 37 and 38 does not limit the scope of these claims.

Concerning the objection to the drawings, attached is a new formal drawing.

The rejection of claims 37 and 38 under 35 U.S.C. § 112, second paragraph has been overcome by the above amendments to these claims.

Claims 1-4, 18, 19, 20 and 21 have been rejected under 35 U.S.C. § 103 as being unpatentable over Dubin in view of Hong. Claims 5, 7, 22, 24, 37 and 38 have been rejected over Dubin in view of Hong and in view of Zhao. The cited references do not render obvious the present invention. In particular, as appreciated by the Examiner, Dubin fails to suggest a conductive film over the upper surface of the conductor having a thickness of 1 to 20 nanometers. In fact, Dubin seems to suggest a film of 150-200 nanometers thick (see column 6, lines 20-22). Dubin relates to electrolessly depositing a CoWP film. Crucial to the suggestions in Dubin is the CoWP film (e.g., see column 2, line 63 to column 3, line 20). Furthermore, electroless deposition is important in the suggestions of Dubin. Along these lines (see column 8, lines 39-51). The film of Dubin is orders of magnitude greater than that of the present invention.

Hong was relied upon for a disclosure of 9 nanometers. However, Hong is not even properly combinable with Dubin since, among other things, Hong does not relate to CoWP films which are essential according to Dubin. Instead Hong suggests a layer of metallic oxide or carbide such as Al_2O_3 , Cr_2O_3 , TiO_2 , AlC , TiC or CrC . (see column 5, lines 19-21).

Moreover, Hong does not suggest employing electroless deposition for forming such a

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layer as required by Dubin. Also see claims 2, 4, 5, 6, 7, 8, 19, 21, 22, 24, 25, 35 and 36 of the present application. Critical to the suggestions of Hong is the use of a specific chemical vapor deposition techniques. In fact at column 1, lines 29-36, Hong discusses problems of depositing their film, which are to be addressed by the particular techniques suggested therein.

Accordingly, use of electroless deposition would be contrary to the suggestions in Hong.

There is no motivation listed in the cited art to combine Hong and Dubin. As discussed in the specification, the resistivity of the Cu line is not affected or increased by more than 20%; the electrical leakage is eliminated; and no further planarization of the Cu line is needed.

Zhao fails to overcome the above discussed deficiencies of Dubin and Hong with respect to rendering obvious the present invention. In particular, Zhao was merely relied upon for a disclosure of annealing. However, Zhao is not even properly combinable with Dubin since, among other things, Zhao does not suggest CoWP film required by Dubin. The capping layers suggested by Zhao are 500-1500 angstroms (i.e. -50-150 nanometers) (see column 8, lines 18-31) and include Ni-Co, CoP, NiCoP or NiP (see column 8, lines 12-15).

Claims 1, 9, 10, 18, 26 and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Maydan et al. in view of Hong. Maydan fails to render obvious the above claims since, among other things, Maydan does not relate to the problems addressed by the present invention and does not even remotely desires the importance of the thickness of a metal barrier layer.

The above discussion of Hong is incorporated herein by reference. Hong does not overcome the above discussed deficiencies of Maydan with respect to rendering obvious the above claims. In fact, Hong is not even properly combinable with Maydan since Hong suggests a layer of an oxide or carbide such as Al_2O_3 , Cr_2O_3 , TiO_2 , AlC , TiC , or CrC , whereas, Maydan refers to W. No motivation exists in the cited art to combine Maydan and Hong.

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Claims 1, 2, 18 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Hong. Claims 8, 25, 35 and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Hong and further in view of Zhao. The cited references fail to render obvious the above claims.

Lee relates to an electrodes plating process but fails to even remotely suggest the thickness of the conductive film as employed according to the present invention. Critical to the process discussed by Lee is the electroless metallization. In addition, with respect to claim 1 and claims dependent thereon, Lee does not suggest forming a planarized upper surface of the conductor as recited in these claims. Moreover, since Lee requires subsequent insulation layer and patterning the insulation layer, forming the planarized upper surface does not seem to be especially suitable in Lee.

The above discussion of Hong and Zhao are incorporated herein by reference.

Hong was relied upon for a disclosure of 9 nanometers. However, Hong is not even properly combinable with Lee since, among other things, Hong does not suggest employing electroless deposition for forming the conductive layer as required by Lee. Critical to the suggestions of Hong is the use of a specific chemical vapor deposition techniques. In fact at col. 1, lines 29-36, Hong discusses problems of depositing their film, which are to be addressed by the particular techniques suggested therein. Accordingly, use of electroless deposition as required by Lee would be contrary to the suggestions in Hong.

Zhao fails to overcome the above discussed deficiencies of Lee and Hong with respect to rendering obvious the present invention. In particular, Zhao was merely relied upon for a disclosure of annealing. However, it would not be obvious to employ the annealing of Zhao since Lee was already of Zhao (see column 4, lines 49-52) and it seems logical that Lee would have discussed annealing if such were deemed appropriate for the process of Lee. The capping layers suggested by Zhao are 500-1500 angstroms (i.e. -50-150 nanometers) (see column 8, lines 18-31) which lead away from the thickness recited in the present claims.

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The mere fact that cited art may be modified in the manner suggested by the Examiner does not make this modification obvious, unless the cited art suggest the desirability of the modification. No such suggestion appears in the cited art in this manner. The Examiner's attention is kindly directed to *In re Lee* 61 USPQ2d 1430 (Fed. Cir. 2002) *In re Dembiczak et al.* 50 USPQ2d. 1614 (Fed. Cir. 1999), *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Laskowski*, 10 USPQ2d. 1397 (Fed. Cir. 1989) and *In re Fritch*, 23 USPQ2d. 1780 (Fed. Cir. 1992).

In *Dembiczak et al.*, supra, the Court at 1617 stated: "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, E.g., *C.R. Bard, Inc., v. M3 Sys., Inc.*, 157 F.3d. 1340, 1352, 48 USPQ2d. 1225, 1232, (Fed. Cir. 1998) (describing 'teaching or suggestion motivation [to combine]' as in 'essential evidentiary component of an obviousness holding'), *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d. 1453, 1459 (Fed. Cir. 1998)('the Board must identify specifically...the reasons one of ordinary skill in the art would have been motivated to select the references and combine them');...".

Moreover, it is impermissible under 35 U.S.C. 103 to use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. See *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988). Furthermore, it is well settled that hindsight reconstruction using the patent application as a guide through the maze of prior art references, combining "the right references in the right way" so as to achieve the result of the claimed invention must be avoided. See *Grain Processing Corp. v. American Maize-Products Corp.*, 5 USPQ2d 1788 (Fed. Cir. 1988).

The prior art fails to provide the degree of predictability of success of achieving the properties attained by the present invention needed to have a rejection under 35 U.S.C. 103 sustained. See *In re Mercier*, 187 USPQ 774 (CCPA, 1975) and *In re Naylor*, 152 USPQ 106 (CCPA, 1966).

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Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed. Cir. 1990), *In re Antonie*, 195, USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).


The Commissioner is authorized to charge any deficiency to our Deposit Account No. 22-0185, under Order No. 20140-00300-US from which the undersigned is authorized to draw.

The Examiner is respectfully requested to enter this Amendment After Final, in that it raises no new issues, but merely places the claims in a form more clearly patentable over the references of record. In the alternative, the Examiner is respectfully requested to enter this Amendment After Final in that it reduces the issues for appeal.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185.

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Respectfully submitted,

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